UCID- 20791

Cost Trends for Electric Power Generation 1979 - 1984

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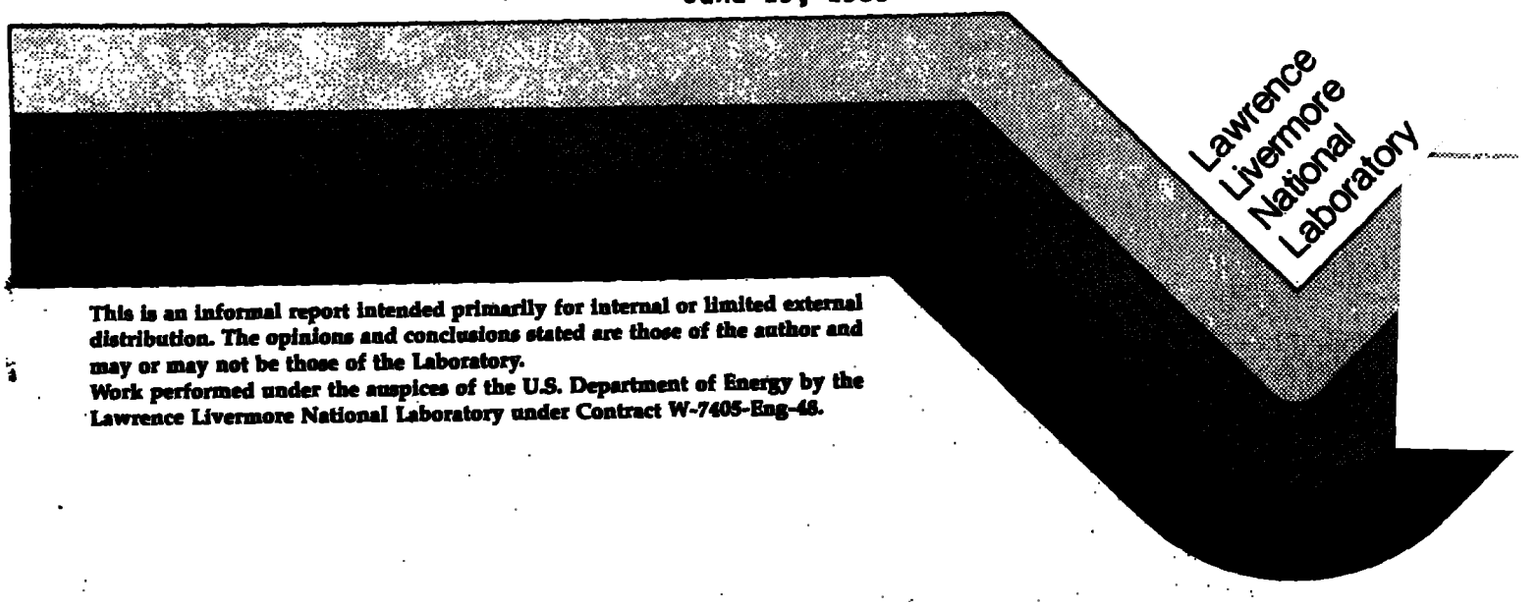
June 19, 1986



Work performed under the auspices of the U.S. Department of Energy by the Lawrence Livermore National Laboratory under Contract W-7405-Eng-48.

COST TRENDS FOR ELECTRIC POWER GENERATION 1979 - 1984

James N. Dezendorf*

This document presents the results of a statistical study of the capital that major U. S. utilities have committed to plant and equipment between 1979 and 1984, and the percentage of operating expense that fuel cost now represents as compared to previous years. Some totals for the 31 companies are presented also.

The data for this study has been taken from the published annual reports of 31 utilities representing all regions of the country. This exercise is not a clearly defined science and these statistics are not meant to represent exact amounts for the categories described; the accounting and legal aspects of utility financial reporting is necessarily complex. This study is meant to show the general level and direction of the category of expenses listed. Whenever the information was available, the presence or absence of nuclear plants in the data is indicated in the tables (where XN means Without Nuclear, PN means Partial Nuclear Included and WN means With Nuclear).

Table I lists actual revenues and fuel costs (including purchased power) as a percentage of revenue for the period 1979 through 1984 and, where available, 1974. As can be seen from the tables, in a number of instances fuel costs now exceed 50% of revenues. Recent decreases in oil prices may reduce this percentage temporarily; but fuel cost adjustment clauses will soon reduce revenues accordingly also.

Table II compares the Gross Plant assets in 1979 and 1984. The net increase in plant assets, representing the investment in Plant during that period, is listed in the third column. Also listed is the generating capacity in 1984 and the net increase in capacity between 1979 and 1984 as a result of the above investment. (Plant capacity is given in units of thousands of kilowatts, denoted M/KW.)

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Table III is derived from the data in Table II. The first column gives the cost per kilowatt of plant capacity available in 1984, obtained by dividing the total Gross Plant assets in 1984 by the plant capacity. The second column gives the cost per kilowatt in 1979. Notice the considerable increase in capital cost per kilowatt over this period of time. Even more striking is the incremental cost per kilowatt given by dividing the Increase in plant assets between 1979 and 1984 (third column of Table II) by the corresponding Increase in plant capacity (fifth column of Table II).

Finally, the last two columns of Table III give the cost of maintenance in 1984 and the percentage increase in maintenance costs between 1979 and 1984. Note that in several instances this increase exceeds 100%.

It should be noted that a very large percentage of the utility industry's exposure and involvement with the construction, operation and future dismantling of nuclear power plants is being deferred. While details are not easily obtained, it would appear that these deferrals now add up to hundreds of billions of dollars of future liabilities for the industry. Some of the categories are: deferred construction costs; nuclear fuel leases and deferred purchase constracts; no or little provision for spent fuel disposal; no provision for dismantlement; actual life of plant possibly less than estimates; deferred write-offs of stopped plants, closed or unopened but completed plants, and contamination or other accidental closures. All of the costs stated in this study contain little of these future liabilities.

While we believe that much of the increases in the cost of new plant capacity can be attributed to the nuclear fission reactor power plants, there are also other factors. In some areas labor is much more expensive. Material costs vary enormously around the United States, and management practices vary widely.

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Definitions for Abbreviations used in the Tables:

M/KW	=	Thousands of Kilo-watts
(PL)	=	Peak Load
(XN)	=	Without Nuclear
(PN)	=	Partial Nuclear Included
(WN)	=	With Nuclear
(O&M)	=	Operating and Maintenance
TMI	=	Three Mile Island

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TABLE I.

UTILITY INDUSTRY STATISTICS

FUEL & POWER SUPPLY EXPENDITURES

		1984 Revenues (Thousands)	1984 Fuel Costs (Thousands)	Percent (%) of Revenues				
				1984	1983	1982	1979	1974
1.	AMERICAN ELECTRIC POWER	4,951,901	2,104,798	42.5	40.7	42.8	46.5	
2.	ARIZONA PUBLIC SERVICE	994,967	192,923(XN)	19.4	22.1	23.5	41.6	
3.	BALTIMORE GAS & ELECTRIC	1,208,145	630,269	35.8	39.9	43.0	33.4	
4.	CAROLINA POWER & LIGHT	1,854,250	592,436(XN)	32.0	32.5	34.0	33.3	
5.	CENTRAL & SOUTHWEST CORP.	2,766,156	1,405,399	50.8	52.4	53.0	54.9	
6.	CLEVELAND ELECTRIC ILLUMINATING CO.	1,215,353	313,412(XN)	25.8	27.5	29.8	42.4	
7.	COMMONWEALTH EDISON	4,929,671	1,549,014(PN)	31.4	33.8	36.1	44.3	
8.	CONSOLIDATED EDISON	6,728,831	2,208,888(PN)	38.6	39.8	42.1	36.4	35.7(75)
9.	CONSUMERS POWER CO.	3,325,570	1,707,614	52.8	53.4	52.6	56.8	
10.	DETROIT EDISON	2,498,205	885,529(PN)	35.5	34.9	37.4	43.9	
11.	DUKE POWER	2,710,015	683,563(PN)	25.2	30.6	34.8	39.5	
12.	FLORIDA POWER & LIGHT CO.	3,940,934	1,692,059	49.6	49.7	53.0	42.6	42.1
13.	GENERAL PUBLIC UTILITIES CORP.	2,735,286	1,243,268	50.1	51.8	46.9	46.0	33.4(75)
14.	HOUSTON INDUSTRIES	4,181,575	2,133,548	60.5	61.2	63.1	56.5	
15.	ILLINOIS POWER CO.	1,280,537	583,098	45.5	49.5	52.8	48.5	33.3(75)
16.	LONG ISLAND LIGHTING CO.	1,973,550	885,096 (XN+)	44.8	47.8	48.3	45.7	
17.	MIDDLE SOUTH UTILITIES	3,146,035	1,911,542	60.8	63.2	64.6	60.1	39.7

TABLE I CONTINUED

		1984 Revenues (Thousands)	1984 Fuel Costs (Thousands)	Percent (%) of Revenues 1984	1983	1982	1979	1974
18.	NIAGARA MOHAWK POWER CORP.	2,785,546	1,306,052	46.9	50.0	49.9	48.6	41.7(75)
19.	NORTHERN STATES POWER CO.	1,764,609	690,441	39.2	38.2	36.9	32.8	30.3
20.	OHIO EDISON	1,637,104	479,464 (XN)	29.3	31.0	34.0	37.9	
21.	PACIFIC GAS & ELECTRIC CO.	7,829,703	3,921,817 (PN)	50.1	49.2	52.8	62.8	55.5(75)
22.	PENNSYLVANIA POWER & LIGHT CO.	1,562,782	892,623					
			(X Resale)	57.1	76.4	56.8	72.3	
			(with Resale)	15.7	17.3	32.1	23.0	
23.	PHILADELPHIA ELECTRIC CO.	2,981,017	1,122,177 (XN)	41.4	47.3	49.5	43.8	
24.	PORTLAND GENERAL ELECTRIC CO.	722,068	118,728 (XN)	16.5	17.8	16.3		
25.	PUBLIC SERVICE ELECTRIC & GAS CO.	2,816,241	1,695,388	42.1	45.3	47.8	44.1	44.9
26.	PUBLIC SERVICE INDIANA	910,276	432,568					
			(PN-X Sales)	47.6	42.9	44.1	49.8	
			(with Sales)	27.0	35.3	34.7	37.0	
27.	PUGET SOUND POWER & LIGHT CO.	657,235	177,343 (XN)	27.0	26.2	26.5		
28.	SOUTHERN CALIFORNIA EDISON CO.	4,899,152	2,084,941 (XN)	42.6	45.4	51.8	59.8	39.8
29.	THE SOUTHERN CO.	6,123,985	3,326,101	52.7	50.0	50.9	50.5	49.8
30.	TEXAS UTILITIES CO.	3,932,235	1,682,699 (PN)	42.8	43.8	41.8	34.2	23.9
31.	UNION ELECTRIC COMPANY	1,412,414	440,821 (PN)	38.3	38.4	38.8	35.1	24.7
		$90,475,348	$39,093,619					

TABLE II

UTILITY INDUSTRY STATISTICS

GROSS UTILITY PLANT, COST PER KILO-WATT, AND MAINTENANCE

		GROSS PLANT (Thousands) 1984	1979	INCREASE (Thousands)	1984 GENERATING CAPACITY M/KW	INCREASE FROM 1979 M/KW
1.	AMERICAN ELECTRIC POWER	$14,568,369	$9,350,305	$5,218,064	23,351	302
2.	ARIZONA PUBLIC SERVICE	5,088,243	1,759,383	3,328,850	3,426	349
3.	BALTIMORE GAS & ELECTRIC	4,391,932	2,275,902	2,116,030	5,498	698
4.	CAROLINA POWER & LIGHT	6,383,729	4,102,975	2,280,754	8,384	588
5.	CENTRAL & SOUTHWEST CORP.	7,417,465	4,211,900	3,205,565	12,217	2220
6.	CLEVELAND ELECTRIC ILLUMINATING CO.	5,022,543	2,842,253	2,180,290	4,329	(200)
7.	COMMONWEALTH EDISON	17,458,121	11,170,649	6,287,472	14,572 (PL) TOTAL ADD:	772 4396
8.	CONSOLIDATED EDISON	9,342,500	7,717,783	1,624,717	10,568	21
9.	CONSUMERS POWER CO.	10,013,738	6,094,194	3,919,544	6,754	231 (XN)
10.	DETROIT EDISON	9,752,346	5,660,023	4,092,323	8,898	Assume 1032
11.	DUKE POWER	8,798,884	5,480,012	2,190,414	13,594	1546
12.	FLORIDA POWER & LIGHT CO.	8,881,062	5,458,512	3,422,550	13,470	2513
13.	GENERAL PUBLIC UTILITIES CORP.	6,035,383 7,139,977 with TMI	5,289,173	1,850,804	8,251	(11)
14.	HOUSTON INDUSTRIES	7,452,657	4,560,660	2,891,997	13,200	1593
15.	ILLINOIS POWER CO.	4,406,210	2,543,503	1,862,707	3,742	(73)
16.	LONG ISLAND LIGHTING CO.	6,904,013	3,799,292	3,104,721	3,778	(172)
17.	MIDDLE SOUTH UTILITIES	13,294,647	7,002,052	6,300,000	10,456 (peak load)	(231)

TABLE II CONTINUED

		GROSS PLANT (Thousands) 1984	1979	INCREASE (Thousands)	1984 GENERATING CAPACITY	INCREASE FROM 1979 M/KW
18.	NIAGARA MOHAWK POWER CORP.	$ 7,146,795	$ 4,234,677	$2,912,118	7705	649
19.	NORTHERN STATES POWER CO.	4,613,284	3,222,174	1,391,610	6458	614
20.	OHIO EDISON	7,191,492	3,757,493	3,433,999	4093(PL)	(117)
21.	PACIFIC GAS & ELECTRIC CO.	18,138,334	11,025,248	7,113,086	15,887	802
22.	PENNSYLVANIA POWER & LIGHT CO.	7,354,665	4,074,572	3,280,093	7415	869
23.	PHILADELPHIA ELECTRIC CO.	10,311,103	5,885,501	4,425,602	7765	38
24.	PORTLAND GENERAL ELECTRIC CO.	2,588,875	1,891,845	697,030	2862	(92)
25.	PUBLIC SERVICE ELECTRIC & GAS CO.	9,870,429	6,325,030	3,545,399	8999	(24)
26.	PUBLIC SERVICE INDIANA	2,500,605	2,153,335	347,270	5937	682
	WN	5,220,622	2,595,105	2,625,517	7037	1782
27.	PUGET SOUND POWER & LIGHT CO.	2,361,649	1,155,844	1,205,805	4189	875
28.	SOUTHERN CALIFORNIA EDISON CO.	12,835,031	7,577,670	5,257,361	14819	1748
29.	THE SOUTHERN CO.	18,282,589	11,700,217	6,582,372	26,165	2178
30.	TEXAS UTILITIES CO.	11,031,699	6,631,618	4,400,081	17,804	461
31.	UNION ELECTRIC COMPANY	6,679,472	3,649,701	3,029,771 (WN)	6952(XN)	1105(WN)
		$269,942,475		$105,776,646		

TABLE III.

UTILITY INDUSTRY STATISTICS

GROSS UTILITY PLANT, COST PER KW, AND MAINTENANCE

		Cost per KW 1984	Cost per KW 1979	Cost of Increase Per KW	Maintenance (Thousands) 1984	Percent Increase 1979-84
1.	AMERICAN ELECTRIC POWER	$623.88	$304.74	$187165.89	$327,046	90.1%
2.	ARIZONA PUBLIC SERVICE	1485.19	571.79	9538.25	68,207	41.4%
3.	BALTIMORE GAS & ELECTRIC	633.94	474.15	3031.56	115,911	78.6%
4.	CAROLINA POWER & LIGHT	761.42	526.29	3878.83	183,906	132.9%
5.	CENTRAL & SOUTHWEST CORP.	607.14	421.32	1443.95	116,420	127.5%
6.	CLEVELAND ELECTRIC ILLUMINATING CO.	1160.21	630.35	NM	90,325	66.7%
7.	COMMONWEALTH EDISON	1198.06	809.47	8144.329	316,141	76.5%
			Total Add:	1430.26		
8.	CONSOLIDATED EDISON	884.13	731.75	77367.48	361,609	27.8%
9.	CONSUMER POWER CO.	1482.64	934.26	16967.72	134,463	17.4%
		1974=656.98;	Nuclear Plant=	3812.75		
10.	DETROIT EDISON	1096.02	631.42	3720.29	203,945	58.1%
			1974=432.75			
11.	DUKE POWER	647.26	548.01	1416.82	207,951	121.3%
12.	FLORIDA POWER & LIGHT CO.	659.36	498.18	1361.94	226,573	127%
13.	GENERAL PUBLIC UTILITIES	731.47	640.18	NM	243,000	167%
		865.35 with	TMI			
14.	HOUSTON INDUSTRIES	564.60	392.92	1815.44	521,386(O&M)	112.6%
15.	ILLINOIS POWER CO.	1177.50	666.71	NM	47,763	26.3%
16.	LONG ISLAND LIGHTING CO.	1827.43	961.85	NM	60,568	17.3%
17.	MIDDLE SOUTH UTILITIES	1271.49	655.19	NM	161,433	45%

TABLE III CONTINUED

UTILITY INDUSTRY STATISTICS

GROSS UTILITY PLANT, COST PER KW, AND MAINTENANCE

		Cost per KW 1984	Cost per KW 1979	Cost of Increase Per KW	Maintenance (Thousands) 1984	Percent Increase 1979-84
18.	NIAGARA MOHAWK POWER CORP.	$ 927.55	$600.15	$4487.09	$140,987	41%
19.	NORTHERN STATES POWER CO.	714.35	551.36	2266.47	134.110	81.1%
20.	OHIO EDISON	1757.02	892.52	NM	129,313	30%
21.	PACIFIC GAS & ELECTRIC CO.	1141.71	730.88	8869.19	287,882	116.5%
22.	PENNSYLVANIA POWER & LIGHT CO.	991.86	622.45	3774.56	219,002	119%
23.	PHILADELPHIA ELECTRIC CO.	1327.90	761.068	NM	245,583	108.5%
24.	PORTLAND GENERAL ELECTRIC CO.	904.57	640.44	NM	34,039	40%(Est)
25.	PUBLIC SERVICE ELECTRIC & GAS CO.	1096.84	700.99	NM	269,974	81.2%
26.	PUBLIC SERVICE INDIANA	421.19	409.77	509.19	63,721	39.1%
	(WN)	879.34	493.84	1473.35	(2472.74 -- Nuclear Alone)	
27.	PUGET SOUND POWER & LIGHT CO.	563.77	348.78	1378.06	31,157	100%
28.	SOUTHERN CALIFORNIA EDISON CO.	866.12	579.73	3007.64	419,458	137.3%
29.	THE SOUTHERN CO.	695.69	487.77	3022.21	483,126	97.1%
30.	TEXAS UTILITIES CO.	619.62	382.38	9544.64	269,940	107.7%
31.	UNION ELECTRIC COMPANY	960.80	525.36	2741.87	106,368	49.4%